

The present invention is directed to a sheet cosmetic comprising an aqueous gel sheet in the absence of a supporting layer.

The rejection of Claims 1-6 under 35 U.S.C. § 103(a) over JP 11-269,031 is respectfully traversed.

Applicants note, that JP 11-269,031 was published on October 5, 1999. The present application claims the benefit of priority to PCT/JP 99/06800 filed on December 3, 1999 which claims the benefit of priority to Japanese application JP 10-344,581, filed with the Japanese Patent Office on December 3, 1998. Applicants' Japanese filing date of December 3, 1998 is before the publication date of JP 11-269,031. Applicants respectfully request the benefit of priority to JP 10-344,581. A certified copy of the priority document was filed with the U.S. Patent and Trademark Office in its capacity as an elected office. Applicants enclose herewith a Certified English Translation of JP 10-344,581. As Applicants have requested the full benefit of priority to Applicants' Japanese filing date of December 3, 1998, a date before the publication date of the cited reference, the reference is not believed to be available as prior art against the present application. Withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

Applicants submit this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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IN THE CLAIMS

Claims 7-19 (new)

DECLARATION

I, Yoshiaki TODAKA of c/o The Patent Corporate Body ARUGA PATENT OFFICE, 3-6, Nihonbashiningyocho 1-chome, Chuo-ku, Tokyo 103-0013 Japan do solemnly and sincerely declare that I well understand both Japanese and English languages and that I believe the attached English version is a true and complete translation of Japanese Patent Application No. 10-344581 filed on December 3, 1998 in the name of Kao Corporation.

December 10, 2002

  
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10-344581

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[Title of the Invention] Sheet Cosmetics

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[List of Appended Documents]

[Document Name]	Specification	1
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[Request of Identification of Data] Requested

[Document Name]

Specification

[Title of the Invention]

Sheet Cosmetics

[What is Claimed is]

[Claim 1] A sheet cosmetic comprising an agar ingredient (A), wherein said agar ingredient (A) is obtained by subjecting raw seaweed having a sulfate group content of 1-10% to extraction with neutral hot water and exhibits a gel strength at an agar content of 1.5 wt.% of 600 g/cm<sup>2</sup> or less.

[Claim 2] A sheet cosmetic as described in claim 1, wherein the agar ingredient (A) has a viscosity (at 85°C) of 15 mPa·s or more as measured in sol form with a 1.5 wt.% agar content.

[Claim 3] A sheet cosmetic as described in claim 1 or 2, wherein the agar ingredient (A) has an average molecular weight of 400,000 to 2,000,000.

[Claim 4] A sheet cosmetic as described in any one of claims 1 to 3, wherein the agar ingredient (A) requires, in 20% deformation stress relaxation measurement performed on a 1-mm-thick gel sample of the agar ingredient of a 1.5 wt.% agar content, 8 seconds or longer for an initial stress to decrease to half the initial value.

[Claim 5] A sheet cosmetic as described in any one of claims 1 to 4, which contains the agar ingredient (A) in an amount of 0.01 to 5 wt.%.

[Detailed Description of the Invention]

[0001]

[Technical Field to Which the Invention Pertains]

The present invention relates to a sheet cosmetic which exhibits strong adhesion to the skin; provides no sense of incongruity when applied to the skin; and achieves excellent moistening and cooling effects on the skin.

[0002]

[Background Art and Problems to be Solved by the Invention]

Conventionally, there have been known sheet cosmetics for application to the skin, which cosmetics are formed of a supporting sheet coated or impregnated with a cosmetic containing, for example, a humectant or a whitening agent. Thus, the sheet cosmetics are employed in order to attain effects such as promoted permeation of active ingredients and enhanced smoothness of the skin by virtue of elution of an aqueous polymer from the sheet.

Generally, such a supporting sheet is formed of woven fabric or non-woven fabric. In addition, there have been known supporting sheets formed of natural polymer; e.g., a sheet formed of freeze-dried collagen (Japanese Patent Application Laid-Open (*kokai*) No. 63-162610), a sheet formed of freeze-dried alginic acid (Japanese Patent Application Laid-Open (*kokai*) No. 3-223213), and a pullulan sheet.

[0003]

However, when the sheet is formed of woven fabric or non-woven fabric, the thickness of the sheet increases, thereby providing incongruent sensation during use and



raising a problem of weak adhesion sensation to the skin, which are disadvantageous. Sheets formed of freeze-dried collagen or alginic acid, having high solubility in a cosmetic lotion or a similar product, exhibit a shape-maintaining property insufficient for producing cosmetics. In addition, sheet ingredients remain in large amounts on the skin, to thereby disadvantageously provide sticky sensation.

[0004]

[Means for Solving the Problems]

The present inventors have carried out extensive studies, and have found that, by use of an agar produced from specific seaweed and having a predetermined gel strength, there can be obtained a sheet cosmetic that exhibits strong adhesion to the skin; provides no sense of incongruity when applied to the skin; exhibits excellent permeation of active ingredients to the skin; and exerts effects such as moistening effect, cooling effect, and astringent effect provided by shrinkage of gel.

[0005]

Accordingly, the present invention provides a sheet cosmetic comprising an agar ingredient (A), wherein said agar ingredient (A) is obtained by subjecting raw seaweed having a sulfate group content of 1-10% to extraction with neutral hot water and exhibits a gel strength at an agar content of 1.5 wt.% of 600 g/cm<sup>2</sup> or less.

[0006]

[Modes for Carrying Out the Invention]

The agar ingredient (A) is obtained by subjecting raw seaweed having a sulfate group content of 1-10% to extraction. Examples of such raw seaweed include *Gracilaria verrucosa*, *Gelidium amansii*, and *Pterocladia capillacea*. Preferably, extraction is carried out with neutral hot water so as to obtain agar having a desirable physical property.

[0007]

In view of sensation during use, the agar ingredient (A) of a 1.5 wt.% agar content preferably has a gel strength of 600 g/cm<sup>2</sup> or less, which is lower than that of typical agar, more preferably 10-600 g/cm<sup>2</sup>, particularly preferably 10-400 g/cm<sup>2</sup>. The gel strength is measured in the following manner.

[0008]

(1) Measuring apparatus

Rheometer: NRM-200J (product of Fudo Kogyo)

Plunger: Cylindrical plunger (area of 1 cm<sup>2</sup>)

Sample-stage elevating speed: 2 cm/min

(2) Preparation of samples

1) An agar sample (3.0 g) is measured precisely and placed in a container (volume 0.5 L) whose tare has been measured in advance, and ion-exchange water (50 mL) is added to the container so that the agar absorbs sufficient amounts of water.

2) Warm ion-exchange water is further added, to thereby adjust the content to approximately 210 g, and the resultant mixture is dissolved by heating for 15 minutes in a hot bath.

3) The content is adjusted to 200.0 g and the mixture is poured into a glass container (inner diameter of 49 mm, depth of 57 mm) with a tape around thereon as shown in Fig. 1.

4) The sample is cooled at room temperature for one hour, and capped and allowed to stand at 20°C in a thermostat chamber for one night.

### (3) Measurement of gel strength

After removal of the tape, the portion of the gel protruding the upper edge of the container is cut out by use of a cutter. The thus-formed surface of 1.5 wt.% aqueous gel is subjected to gel strength measurement by use of a rheometer.

[0009]

The agar ingredient (A) preferably has a viscosity (at 85°C) of 15 mPa·s or more, particularly 15-200 mPa·s, as measured in sol form with a 1.5 wt.% agar content, in view of handling during production. In addition, the agar ingredient (A) preferably has an average molecular weight of 400,000-2,000,000. Furthermore, when a 1-mm-thick gel sample of the agar ingredient (A) of a 1.5 wt.% agar content is subjected to 20% deformation stress relaxation measurement, the time required for the initial stress to decrease to half the value is preferably 8 seconds (s) or longer, particularly preferably 8-15 s, in view of the shape-maintaining property. The stress relaxation time is obtained by measuring a 20% compressively deformed sample by use of an apparatus (RSA2, product of Rheometrics) and circular parallel plates

(diameter of 4.75 mm).

[0010]

The agar ingredient (A) is incorporated into the sheet cosmetic preferably in an amount of 0.01-5 wt.%, particularly preferably 0.1-3 wt.%, in view of strength and sensation during use.

[0011]

The sheet cosmetic of the present invention may further contain a water-soluble polymer (B) so as to improve strength and storage stability thereof. The water-soluble polymer to be used may be either natural or synthetic water-soluble polymer. Examples of the water-soluble polymer include polymers having a hydrophilic group such as a hydroxyl group, an ethylene oxide group, or an amido group, with polymers having a hydroxyl group being particularly preferred. Examples of such polymers include natural polymers such as polysaccharides and proteins, and synthetic polymers. Specific examples of the polysaccharides include cationized cellulose, carboxymethyl cellulose, hydroxyethyl cellulose, starch, ionized starch derivatives, block copolymers formed of starch and a synthetic polymer, hyaluronic acid, carrageenin, xanthan gum, chitin, chitosan, pullulan, tuberose polysaccharide, and alginic acid. Specific examples of the proteins include keratin, albumin, and collagen. Specific examples of the synthetic polymers include poly(vinyl alcohol)s and derivatives thereof, modified silicones, and latexes. Of these, polysaccharides are more

preferred.

The water-soluble polymer (B) is incorporated into the sheet cosmetic preferably in an amount of 0.001-50 wt.%, particularly preferably 0.01-10 wt.%.

[0012]

The sheet cosmetic of the present invention may further contain a humectant (C). Examples of the humectant include ethanol, glycerin, 1,3-butylene glycol, propylene glycol, dipropylene glycol, ethylene glycol, 1,4-butylene glycol, polyglycerin such as diglycerin or triglycerin, glucose, maltose, maltitol, sucrose, fructose, threitol, erythritol, and starch sugar. Of these, ethanol, 1,3-butylene glycol, and glycerin are particularly preferred in view of sensation during use.

[0013]

The sheet cosmetic contains the humectant (C) preferably in an amount of 0.001-40 wt.%, particularly preferably 0.01-30 wt.%.

[0014]

Other than the aforementioned ingredients, the sheet cosmetic of the present invention may contain ingredients such as organic acids, oil, sterols, a surfactant, powder, silicones, inorganic salts, a preservative, a pH-regulator, a UV-absorber, a colorant, a pharmaceutically active ingredient, and a perfume.

[0015]

The sheet cosmetic of the present invention is produced,

for example, by dissolving the ingredient (A) and other ingredients in warm water; pouring the resultant mixture into a mold; and cooling the mixture at a temperature not higher than the gelling temperature of agar. Alternatively, the mixture is similarly molded into a sheet having a large area, followed by punching out sheet products of a desired shape.

[0016]

The sheet cosmetic of the present invention preferably has a thickness of 0.1-5 mm, particularly preferably 0.5-2 mm, for attaining less incongruent sensation when applied to the skin.

No particular limitation is imposed on the shape of the sheet, and the sheet can be formed into an arbitrary shape. Specifically, in order to attain an enhanced adhesion to the skin, the sheet may be formed into a shape corresponding to the body part to which the sheet cosmetic is to be applied. For example, when the sheet cosmetic is to be applied to the entirety of the face, the cosmetic sheet may be provided with holes corresponding to the eyes, the nose, and the mouth. Moreover, the sheet cosmetic may be formed into a cloud-like shape or a broad bean shape so as to enable the cosmetic to be applied to the under-eye area.

[0017]

The sheet cosmetic of the present invention can be used in a variety of modes. For example, the cosmetic is applied directly to the skin of the washed face or is applied to a portion of the skin where another cosmetic has already been

applied. Alternatively, the sheet cosmetic of the present invention may first be coated with or impregnated with another cosmetic, then applied to the skin.

[0018]

[Effects of the Invention]

The sheet cosmetic of the present invention exhibits strong adhesion to the skin; provides no sense of incongruity when applied to the skin; exhibits an excellent shape-maintaining property; and achieves excellent cooling effects on the skin.

[0019]

[Examples]

Example 1

Sheet cosmetic samples shown in Table 1 were prepared and evaluated in terms of skin adhesion sensation. The results are shown in Table 1. In Table 1, samples "a" and "b" were prepared by dissolving agar in a commercial cosmetic lotion in an amount of 1.5%, and the resultant mixture was molded into a 1.2-mm-thick sheet sample. Similarly, non-woven fabric and a pullulan sheet were impregnated with the same commercial cosmetic lotion.

[0020]

(Evaluation methods)

(1) Skin adhesion sensation

Ten minutes following the application of a sheet cosmetic to the face, skin adhesion sensation was evaluated by 10 specialized panelists on the basis of the following

ratings:

O: at least 7 panelists answered "high skin adhesion sensation without incongruent sensation";

Δ: 4-6 panelists answered "high skin adhesion sensation without incongruent sensation"; and

X: 3 or fewer panelists answered "high skin adhesion sensation without incongruent sensation."

[0021]

[Table 1]

	a	b	c	d
Sheet material	Agar 1 (invention)	Agar 2	Non-woven fabric	Pullulan
Sheet thickness (mm)	1.2	1.2	1.5	1.5
Skin adhesion sensation	O	Δ	X	X
Gel strength of sheet (g/cm <sup>2</sup> )	415	610	—	—
Sol viscosity at ≤85°C (mPa·s)	12.5	13.8	—	—
Mol. weight	1,500,000	2,200,000	—	—
Stress relaxation half time (s)	8.5	5.3	—	—

[0022]

As is clear from Table 1, the sheet cosmetics according to the present invention (sheets a and b) provide excellent skin adhesion sensation.

[0023]

#### Example 2

The water content and conditions of the skin to which



the sheet cosmetic of the present invention had been applied were evaluated. Specifically, each of the sheet cosmetic of the present invention (sheet a of Example 1) and a comparative sheet cosmetic (poly(acrylic acid) gel sheet cosmetic having a non-woven fabric support, thickness 2 mm) was applied to the skin; maintained for 15 minutes, and peeled off from the skin. The above measurement was performed at 20°C under dry conditions of a relative humidity of 15%. The water content was measured by means of Skicon-200 (product of IBS), and the obtained value was expressed as a relative value with respect to a beauty lotion serving as a standard. The skin conditions (skin texture) were observed as magnified under a microscope, and the texture was visually evaluated by specialists. The conditions of the skin texture before and after application of the sheet cosmetic were compared; the ratings of O, Δ, and X were assigned for improvement of skin texture, slight improvement of skin texture, and no change, respectively. The results are shown in Table 2.

[0024]

[Table 2]

	Agar 1 (invention)	Agar 2	Poly(acrylic acid) + non- woven fabric sheet
Skin water content (relative value)	1.0	0.9	0.8
Skin conditions (texture)	0	0	$\Delta$

[0025]

As is clear from Table 2, use of the sheet cosmetic of the present invention has been proven to improve the effect on water content and conditions of the skin.

[0026]

### Example 3

The effect of promoting permeation of a water-soluble component (amino acid), which effect is provided by the sheet cosmetic of the present invention, was evaluated. Specifically, an amino acid was incorporated into each of the sheet cosmetic of the present invention (sheet a of Example 1) and a comparative sheet cosmetic (poly(acrylic acid) gel sheet cosmetic having a non-woven fabric support, thickness 2 mm), and the thus-prepared sheet cosmetic sample was applied to pig skin. Eighteen hours following the application of the cosmetic sample, the amount of the amino acid permeating the pig skin was measured. The amount is represented by a

relative value with the proviso that the amount of amino acid taken in the pig skin by use of the sheet cosmetic of the present invention is 1. The results are shown in Table 3.

[0027]

[Table 3]

	Agar 1 (invention)	Agar 2	Poly(acrylic acid) + non- woven fabric sheet
Amount of permeating amino acid (relative value)	1.0	0.9	0.4

[0028]

As is clear from Table 3, use of the sheet cosmetic of the present invention has been proven to improve the effect of promoting permeation of amino acid.

[0029]

#### Example 4

The effect of cooling the skin provided by use of the sheet cosmetic of the present invention was evaluated.

Specifically, each of the sheet cosmetic of the present invention and a comparative sheet cosmetic (each of sheet cosmetics of Example 2) was applied to the face; maintained for 10 minutes; and then removed from the face. Subsequently, the skin temperature was monitored, to thereby evaluate the cooling effect. For comparison, the effect provided in the case in which only a lotion was applied to the face was also evaluated. The skin temperature was measured by means of a

radiation thermometer (THI-500, product of TASCO). The results are shown in Table 4.

[0030]

[Table 4]

Skin temperature (°C)	Agar 1 (invention)	Agar 2	Solo lotion	Poly(acrylic acid) + non-woven fabric sheet
Time				
Before application	32.2	32.0	31.8	32.1
Immediately after removal (0 min)	28.1	28.8	30.9	30.3
3 min after	29.1	29.6	31.5	30.9
5 min after	29.6	30.8	31.8	31.3
10 min after	30.8	31.2	32.1	32.3

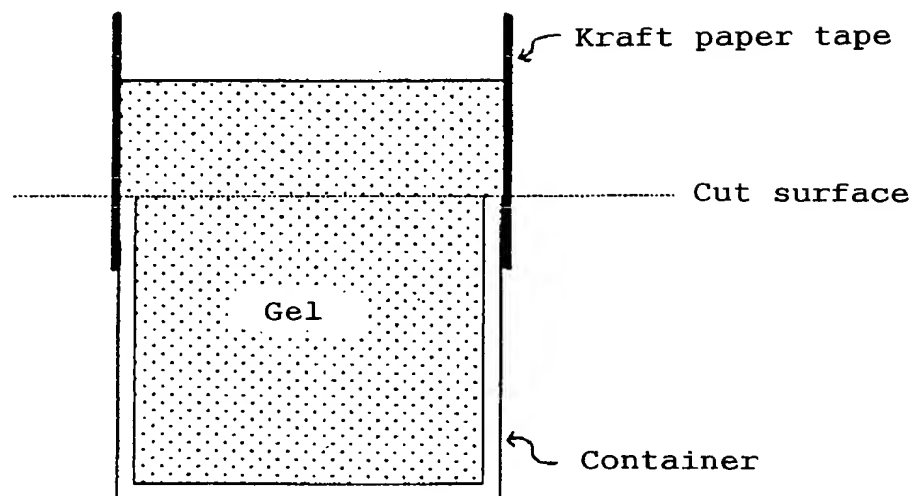
[Brief Description of the Drawings]

[Fig. 1]

Fig. 1 shows a sample container for measuring gel strength of an agar sample and a cut surface.

[Document Name] Drawing

[Fig. 1]



[Document Name] Abstract

[Abstract]

[Means for Solution] A sheet cosmetic containing an agar ingredient (A), wherein the agar ingredient (A) is obtained by subjecting raw seaweed having a sulfate group content of 1-10% to extraction with neutral hot water and exhibits a gel strength at an agar content of 1.5 wt.% of 600 g/cm<sup>2</sup> or less.

[Effects] The sheet cosmetic exhibits strong adhesion to the skin; provides no sense of incongruity when applied to the skin; and achieves excellent moistening and cooling effects on the skin.

[Selected Drawing] None